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UTILITY PATENT APPLICATION TRANSMITTAL

(For new Non-provisional applications under 37 CFR1.53(b))

Attorney Docket No.: RIV6172P
First Named Inventor: Darryl Scott Burkett
Express Mail Label No. EL 601 558 450 US



Box PATENT APPLICATION
Commissioner For Patents
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is a new utility patent application of inventor(s): **Darryl Scott Burkett** and entitled: **TRAILER-MOUNTED CRANE APPARATUS.**

Application Elements:

1. ☒ Specification containing 20 pages (preferred arrangement set forth below)
 - Descriptive Title of the Invention
 - Cross-reference to related applications (if applicable)
 - Statement regarding Federally-sponsored Research & Development (if applicable)
 - Reference to Microfiche Appendix (if applicable);
 - Background of the Invention
 - Brief Summary of the Invention
 - Brief Description of the Drawings (if filed)
 - Detailed Description
 - Claim(s)
 - Abstract of the Disclosure
2. ☒ Drawings: 6 Sheets of ☐ formal drawings ☒ informal drawings
3. ☒ Oath or Declaration
 - a. ☐ An executed declaration or oath for the utility patent application including a power of attorney,
 - b. ☒ An unexecuted declaration or oath for the utility patent application including a power of attorney;
 - c. ☐ Copy from a prior application (37 CFR 1.63(d), for continuation/divisional with No. 16 completed. [Note No. 4 below.]).
 - i. ☐ Signed statement attached deleting inventor(s) named in the prior application (see 37 CFR 1.63(d)(2) and 1.33(b)).
4. ☐ **For CONTINUATION or DIVISIONAL Applications only:** The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 3c, is considered as being part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

5. ☐ Microfiche Computer Program (Appendix)
6. ☐ Nucleotide and/or Amino Acid Sequence submission. including:
☐ Computer readable copy,
☐ Paper copy (identical to computer copy),
☐ Statement verifying identity of above copies.

Accompanying Application Parts:

7. ☐ Assignment Papers (cover sheet, document(s) and requisite fee).
8. ☐ 37 CFR 3.73(b) Statement (where there is an assignee)
☐ Power of Attorney
9. ☐ English Translation document (if applicable)
10. ☐ Information Disclosure Statement (IDS), including PTO-1449
☐ Copies of IDS Citations
11. ☐ Preliminary Amendment
12. ☒ Return Postcard for PTO Mail Room Date Stamp (should be specifically itemized).
13. ☐ Small Entity Statement(s)
☐ Statement filed in prior application, status still proper and desired.
14. ☐ Certified Copy of Priority Document(s) (if foreign priority is claimed).
15. ☐ Other _____
16. ☐ **If Continuing Application**, check appropriate box and supply the requisite information below and in a preliminary amendment:
☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No. _____, filed _____.
Prior application information: Examiner: _____ Group/Art Unit: _____

Fee Calculation

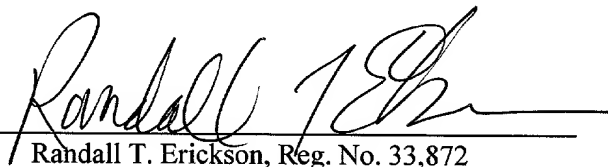
The filing fee has been calculated as shown below:

Small Entity						Large Entity	
For	No. Filed	No. Allowed	No. Extra	Rate	Fee	Rate	Fee
Basic Fee					\$345.00		\$690.00
Total Claims	16	- 20 =		x \$9.00	\$	x \$18.00	\$
Indep. Claims	2	- 3 =		x \$39.00	\$	x \$78.00	\$
Multiple Dependent Claims Present				+ \$130.00	\$	+ \$260.00	\$
				TOTAL	\$345.00	TOTAL	\$

17. ☐ A check in the amount of \$_____ to cover the filing fee is enclosed.
18. ☐ Please charge my Deposit Account No. 04-1644 in the amount of \$_____.
19. ☐ The Commissioner is authorized to charge payment of the following amounts associated with this communication or credit any overpayment to Deposit Account No. 04-1644:
- ☐ Additional filing fees under 37 CFR 1.16 or deficiencies in remittances therefor.
 - ☐ Additional processing fees under 37 CFR 1.17 or deficiencies in remittances therefor.
 - ☐ **ONLY if applicant has partially paid** the patent issue fee under 37 C.F.R. §1.18, then the **deficiency** shall be charged to Deposit Account No. 04-1644, and the Commissioner is authorized to so charge the Deposit Account.

Date: August 23, 2000

Attorney's Signature


Randall T. Erickson, Reg. No. 33,872

Correspondence Address:

ROCKEY, MILNAMOW & KATZ, LTD.

Two Prudential Plaza

180 North Stetson Avenue, Suite 4700

Chicago, Illinois 60601

Telephone: (312) 616-5400

Facsimile: (312) 616-5460

CERTIFICATE OF MAILING BY EXPRESS MAIL


I hereby certify that this Utility Patent Application Transmittal, enclosed application, and any other documents referred to as enclosed herein, are being deposited in an envelope with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated below and addressed to Box PATENT APPLICATION, Commissioner for Patents, Washington, D.C. 20231.

Express Mail Label No.: EL 601 558 450 US

Date of Deposit: August 23, 2000

Typed/Printed Name of Person Signing: Mary Beth Carlson

Signature:



TRAILER-MOUNTED CRANE APPARATUS

Technical Field of the Invention

The present invention relates to cranes, and particularly relates to a
5 trailer-mounted crane which is useful in supporting a vibratory sheet piling
driver.

Background of the Invention

In landscaping architecture, there sometimes exists a need,
10 particularly around water, for the protection of banks and other land
formations from erosion, or a need to maintain a bank at an angle steeper
than its natural soil angle of repose. This is sometimes accomplished by
the use of sheet piling.

In a typical sheet piling installation, individual, elongated steel
15 sheets having channeled edges are driven into the soil, one after another,
in interlocking fashion, to create a sheet piling wall. In this regard, a
vibratory driver is sometimes used to drive the sheets into the ground. A
typical vibratory driver includes a clamping jaw and a vibratory motor, both
hydraulically driven by a separate, engine-driven hydraulic power unit. The
20 driver is suspended from a line or cable from a lifting apparatus, such as
from the bucket of an excavator on a back hoe, and positioned for the jaw
to clamp the sheet piling sheet at its upper edge. Vibration from the driver
causes the sheet to be driven into the ground.

One difficulty in driving sheet piling is related to a type of terrain that
25 may be located adjacent to the area that is to receive the sheet piling.
Where sheet piling is to be driven adjacent to a pond, for example, the
local area can be soft, or uneven. On a golf course, for example, the area

adjacent to the sheet piling, or access ways to that area, may be delicate and can be damaged by heavy equipment.

The present inventor has recognized that it would be desirable that an apparatus used for supporting a vibratory driver for sheet piling is able to operate on surfaces which can include soft, delicate or uneven soil. The present inventor has recognized that it would be desirable that such an apparatus is operable in use on a golf course to install sheet piling around ponds and other areas susceptible to having soft, delicate, and/or uneven ground surfaces. The present inventor has recognized that it would be desirable if a single operator could operate both the supporting apparatus and the vibratory driver from a single operator station.

Summary of the Invention

The invention provides a mobile crane in the form of a trailer-mounted crane apparatus which includes a trailer supported on wheels from the ground. A crane is mounted onto the trailer and includes a crane arm that is extendable outwardly of the trailer. A crane hydraulic power unit for operating the crane arm is also mounted on the trailer. The crane hydraulic power unit is controlled from an operator station carried by the trailer. The operator station includes a control panel and an operator's seat facing the control panel.

10 The trailer includes a trailer hitch connection at a front end thereof adapted for towing the trailer by a vehicle. The trailer rear wheels can mount wide tires to reduce the contact pressure of the tires on the ground. Adjacent each of the rear wheels, a hydraulic outrigger can be utilized for stabilizing the vehicle during use. The trailer can also include two front
15 outriggers, also useful for stabilizing the trailer.

In an exemplary form of the invention, a vibratory sheet piling driver is suspended from the crane arm. The vibratory sheet piling driver can be extended outwardly from the trailer by the crane arm and operated to grasp, position and sink a sheet into the ground. The vibratory driver
20 vibrates to drive the piling sheet into the ground. A vibratory driver hydraulic power unit can be mounted onto the platform and controlled from the control panel.

Using the inventive apparatus, a sheet piling wall can be installed adjacent to soft, loose or uneven ground without difficulty. A trailer-mounted crane apparatus can be configured of a sufficiently light weight to
25

be usable upon delicate ground surfaces, such as are present on a golf course, without damaging the surfaces, such as might occur using a heavier truck-mounted crane or a back hoe. The preferred embodiment crane apparatus of the present invention is compact and usable in close quarters compared to the aforementioned larger truck-mounted cranes or back hoes. The preferred embodiment crane apparatus of the present invention includes wide tires for reducing the surface pressure under the trailer. This allows the trailer to be transported across, and staged on, delicate surfaces such as golf course greens.

10 The preferred embodiment crane apparatus of the present invention comprises a trailer-mounted crane apparatus having a component layout on the trailer that maximizes lifting capacity and reach. The layout includes the hydraulic crane having a vertical center post located centrally of the trailer and having its elongated hydraulic fluid cylinder mounted
15 longitudinally; the crane hydraulic power unit mounted to the front and laterally of the crane center post; the control panel and the associated operator's seat mounted to the front of the crane hydraulic power unit; and the vibratory driver hydraulic power unit mounted in front of the crane. The trailer includes outriggers at the rear corners adjacent respectively to
20 the oversized tires. The trailer includes a vibratory driver cradle for securely holding the vibratory driver on the trailer during road transportation of the trailer. The cradle is located on the trailer laterally of, and behind, the crane on a side opposite to the operator's seat.

 Numerous other advantages and features of the present invention
25 will become readily apparent from the following detailed description of the

invention and the embodiments thereof, from the claims and from the accompanying drawings.

Brief Description of the Drawings

Figure 1 is a perspective view of a trailer-mounted crane apparatus of the present invention in use in installing a piling sheet;

5 Figure 2 is a fragmentary elevational view of the trailer-mounted crane apparatus of Figure 1, in a latter stage of driving a piling sheet;

Figure 3 is an enlarged plan view of the trailer-mounted crane apparatus of Figure 1;

Figure 4 is an elevational view of the crane apparatus taken along line 4-4 shown in Figure 3;

10 Figure 5 is a diagrammatical, plan view of an undercarriage of the trailer and the crane supported thereby;

Figure 6 is a sectional view taken generally along line 6-6 of Figure 5;

15 Figure 7 is a sectional view taken generally along line 7-7 of Figure 5;

Figure 8 is an enlarged, fragmentary front perspective view of the trailer-mounted crane apparatus of Figure 1; and

Figure 9 is a fragmentary perspective view of an alternate embodiment trailer-mounted crane apparatus.

Detailed Description of the Preferred Embodiments

While this invention is susceptible of embodiment in many different forms, there are shown in the drawings and will be described herein in detail specific embodiments thereof with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the specific embodiments illustrated.

Figures 1 and 2 illustrates a trailer-mounted crane apparatus 20 in accordance with the present invention. The apparatus 20 includes a trailer 22 supporting a crane 26. The trailer 22 includes a platform 24 which surrounds the crane 26. The trailer 22 is supported on wheels 32, 34 (shown in Figure 3). The trailer 22 can be further supported or stabilized by two or more outriggers 36, 38, 40, 42 (shown in Figure 3) extending from the platform 24, which can be used to increase the overturning capacity of the crane, or to level the crane as needed. Attached to the platform 24 is an operator's seat 46 which is disposed adjacent to, and laterally of, a control panel 50. The control panel includes control actuators 51.

In a prototype trailer-mounted crane apparatus, a salvaged, solid body trailer (non-tilt) was utilized. The trailer is a standard trailer used in the cable industry for hauling 4000-5000 pound spools of cable and having a capacity of 12,000 pounds.

The crane 26 is of a known configuration such as disclosed in U. S. Patent No. 4,183,712. It is of a hydraulically operated boom configuration having an arm or boom 52 which can telescopically extend outwardly, pivot

upwardly and pivot about a vertical centerline 62 of a central post 64 of the crane 26. The crane arm 52 preferably has a 16 foot reach.

A hydraulic power unit 65 (shown schematically as a box) drives the crane and is in control communication with the panel 50. The power unit
5 typically includes a gasoline or diesel powered engine which drives a hydraulic pump for generating pressurized hydraulic fluid.

The crane center post 64 is welded or otherwise connected to an elongated, cylindrical actuator 68 which is located above, and welded or otherwise connected to, an outrigger cylinder 69, which is mounted and
10 fastened to the trailer 22 as described below. The actuator 68 contains a two-way piston (not shown) which is operatively connected to the center post 64, such as by a rack and pinion arrangement, to cause corresponding rotation of the center post upon linear actuation of the two-way piston. The outrigger cylinder 69 has a substantially rectangular
15 cross-sectional profile. A hydraulic fluid reservoir 70 is fastened or otherwise connected to the outrigger cylinder 69. The center post 64 and reservoir 70 are substantially aligned on a longitudinal centerline 71 of the platform 24, as shown in Figure 3.

The outrigger cylinder 69 is not used for outriggering in the apparatus
20 20. In the prototype trailer-mounted crane apparatus, the crane 26 was salvaged from a lifting vehicle which utilized the outrigger cylinder in a laterally extending orientation such that side outriggers could be deployed laterally to either side of the vehicle and then adjusted vertically to contact the ground. Although the outrigger cylinder was not utilized for deploying
25 outriggers in the prototype, the weight of the outrigger cylinder, arranged

longitudinally, assists in stabilizing the trailer and resisting overturning forces. Additionally, the salvaged crane 26 with its outrigger cylinder 69 arranged longitudinally, conveniently bolts to the cross bracing of the trailer 2, as described hereinafter.

5 At a distal end of the crane arm 52, a support chain, cable or line 74 holds a vibratory device 78 which is used for driving piling sheets 79. The vibratory device 78 includes a hydraulically actuated jaw 82 for gripping a top edge of the piling sheet 79. The vibratory device 78 includes an internal vibrational drive motor (not shown) which, combined with the
10 weight of the vibrational device 78 pressed down on the sheet, causes vibration to drive the sheet 79 into the ground as shown in Figure 2. Such vibratory drivers are known in the industry, such as available from American Pile Driving Equipment Corporation and weighing about 900lbs.

 Figures 3 and 4 illustrate the layout of the trailer-mounted crane
15 apparatus 20. The platform 24 is supported on an undercarriage 102 (shown in Figure 5). The platform includes a surrounding rectangular steel frame 103 and two longitudinal spaced apart deck 105, 107, separated by an open central space 109. The crane 26, including the control panel 50, the actuator 68, the outrigger cylinder 69, the center post 64, and the
20 reservoir 70, as an integral unit, is mounted within the central space 109 onto the undercarriage 102. The undercarriage 102 includes an A-shaped frame 104 having a hitch attachment 106 at an apex thereof. Additionally, two lifting jacks 110, 112 are located adjacent the hitch attachment 106 for lifting the frame 104 in order to engage the hitch attachment 106 to a
25 vehicle hitch.

Between the lifting jacks 110, 112 and the platform 24, a vibrational driver hydraulic power unit or power pack 116 (shown schematically as a box) is mounted on the undercarriage and is dedicated to driving the vibrational driver 78. The power unit 116 typically includes a gasoline or diesel powered engine driving a hydraulic pump to produce pressurized hydraulic fluid. Hydraulic lines 120 schematically indicated in Figure 3 by a single line, and shown in Figure 8, communicate hydraulic fluid control and power from the power unit 116 to the vibrational driver 78. Hydraulic and/or electrical control lines 126 communicate between the control panel 50 and the power unit 116. Thus, an operator siting in the seat 46 can control both the movement and operation of the crane arm 52 and the operation of the vibrational driver 78.

A vibrational driver cradle 130 is located at a rear of the platform 24 and is used for receiving and fixedly holding the vibrational driven 78 during road transportation of the apparatus 20. The cradle has a surrounding wall 131 and an interior plate 132 for clamping by the jaw 82 of the driver 78. An alternate driver retainer in the form of a rod 134 extends rearwardly from the platform 24 and is supported by a support bar 135 within the space 109, and a rear bar 103a of the frame 103. During movement in the field, the vibrational driver can be temporarily held securely onto the rod 134 by the jaw 82. Thus, the more secure, but more time consuming, placement of the driver 78 into the cradle 130 is avoided for short trips in the field. The driver 78 can be quickly and easily clamped to the rod 134 and held thereby. For transportation on the roadway, the driver 78 can be

installed into the cradle 130 and the rod 134 can be recessed behind the rear bar 103a of the frame 103 as shown in phantom.

In front of the cradle 130, and laterally of the crane center post 64, is a hydraulic tubing accumulator box 136. Especially when the driver 78 is stored in the cradle 130, the box 136 can hold hydraulic lines otherwise extending between the power unit 116 and the driver 78 as shown in Figure 8. An onboard tool storage box 140 can be provided in the space between the control panel 50 and the power unit 116.

Figure 5 illustrates the undercarriage 102 and lower crane components supported thereon. The undercarriage comprises longitudinal beams 140, 142 which are laterally spaced apart and connected together by lateral beams 146, 148. The beams 140, 142 support the platform 24 shown in Figures 1-4. The beams 140, 142, 146, 148 can be rectangular tubular members. The connection between the beams can be welded connections. The crane components supported include: the outrigger reservoir 69 arranged longitudinally, the fluid reservoir 70, a support bracket 152, and a base 64a for the rotatable center post 64 all integrally fastened or welded together as a unit. The crane components described are set onto the lateral beams 146, 148 and fastened thereto.

As shown in Figure 6 the lateral outrigger reservoir 69 includes longitudinally arranged bolt channels 158, 160 having open top and bottom faces. A rectangular washer plate 162 is place against opposite faces of each channel 158, 160, the washer plate 162 having a width wider than the open top and bottom faces of the channels. A bottom surface 166 of the lateral outrigger reservoir 69 is supported on the lateral beams 146, 148. A

pair of through bolts 172 and associated nuts 173 clamp the bottom surface 166 to the lateral beam 146, 148 using the two plate washers 162 respectively.

As shown in Figure 7, the support bracket 152 is mounted to the lateral beams 146, 148 in the same fashion. Thus, the crane 26 is bolted in a four point grid on the undercarriage 102.

The lateral beams 146, 148 are spaced approximately equidistant to, and on opposite sides of, an axle 149 which supports the undercarriage 102 from the wheels 32, 34.

Figure 9 illustrates an alternate embodiment trailer-mounted crane apparatus 200 which is substantially identical to the apparatus 20 except that the outriggers 36, 38, 40, 42 are replaced with outwardly extending, pivotable outriggers 238 at all four corners which pivot downwardly to press rectangular pads 240 onto the ground. These outriggers 238 allow a wider support, extending out about 5 feet from the platform 24. These outriggers 238 each utilize an arm 244 pivotally connected to the pad 240. The arm is pivotally connected at a point 246 to the platform 24 and to a channel-shaped riser 248. The riser is braced by a column 252 fixedly connected to the platform 24. A hydraulic cylinder 258 is pivotally connected at a connection 262 to the riser 248 and at a connection 266 to lugs 267 welded to the arm 244. Thus, expansion or contraction of the hydraulic cylinder 258 will cause pivotal lowering or raising of the arm. The arm 244 can be raised to a substantial vertical position for road travel. The outriggers 238 can be controlled from the control panel 50.

It is also encompassed by the invention that outriggers 238 are only provided at the rear corners, which has been demonstrated to work satisfactorily. It is also encompassed by the invention to provide the vertically movable outriggers 36, 38, 40, 42 along with the outriggers 238, at the rear corners only or at all four corners. Depending on the surface encountered, the outriggers 36, 38, 40, 42 and/or the outriggers 238 can then be deployed.

The major components for the crane apparatus 20, 200 are commercially available. For example, the crane 26 can be a HIAB-FOGO (Sweden) model 650 (year 1971) or similar. The vibratory driver 78 and the driver hydraulic power unit 116 can be a Model 6 vibratory hammer and Model 14 power pack from American Piledriving Equipment, Inc. of Kent, Washington. The trailer platform 24 can be a Vermeer single axle (6 foot by 9 foot platform) trailer having a 16' overall length, such as salvaged from a trailer used to transport large electrical coils.

The preferred dimensions for the apparatus 20 are as follows (referring to Figures 3 and 4). The wheel base dimension a is about 108 inches. The longitudinal dimension b between the rear outriggers 36, 38 and the wheel centerline is about 55 inches. The longitudinal distance c between the wheel centerline and the front outriggers 40, 42 is about 53 inches. The longitudinal distance d between the front outriggers 40, 42 and the hitch 106 is about 7 feet. The wheels 32, 34 use tires 32a, 34a which are oversized and are particularly useful in travel throughout a golf course where damage to delicate or pristine areas of the course must be avoided. For example, the tires 32a, 34a will not damage the surface of a

putting green. The width of the tires of the preferred embodiment are effective to dissipate the trailer load over a wide ground surface area. The tires are nearly twice the width of the street tires (using 8.75 inch rims for road use) which are used to transport the trailer on roadways. In this regard, the tires have a tread width f of 16 inches. The ground height g to the support point of the crane 26 is about $19\frac{1}{2}$ inches.

The prototype crane apparatus 20 has a total weight of approximately: 5600 pounds. The crane assembly, including the components 26, 50, 65, weighs about 2700 pounds. The vibratory driver 78 weighs about 900 pounds. The vibratory driver power unit 116 weighs about 700 pounds. The trailer weighs about 600 pounds. The outriggers shown in Figure 9 (rear only) together weigh about 650 pounds.

The present invention provides a compact, lightweight yet effective trailer-mounted crane apparatus especially suited for soft or delicate terrains. The compact trailer-mounted crane apparatus has a lifting capacity of at least 1200 pounds at a reach of 16 feet which is well suited for driving sheet piling using a 900 pound vibratory driver.

The present invention is particularly useful in driving sheet piling on golf courses. Using a vibratory driver, sheets can be driven at night without generating an excessive amount of noise.

The present invention apparatus 20, 200 effectively combines a lifting apparatus with a vibratory driver device into a single, compact and effective piece of equipment. A single operator seated on the trailer can control both the crane and the vibratory driver. Heretofore, the vibratory driver was lifted by an operating piece of equipment such as a back hoe,

and the vibratory drive was controlled by a second operator with the vibratory hydraulic power unit located separate from the back hoe. This unnecessarily used staging area which could be better suited in storing materials or staging other equipment participating in the sheet piling

5 installation.

From the foregoing, it will be observed that numerous variations and modifications may be effected without departing from the spirit and scope of the invention. It is to be understood that no limitation with respect to the specific apparatus illustrated herein is intended or should be inferred. It is,
10 of course, intended to cover by the appended claims all such modifications as fall within the scope of the claims.

THE INVENTION CLAIMED IS:

1. A mobile crane apparatus, comprising:
a trailer supported on at least one pair of wheels;
5 a hydraulically operated crane supported on said trailer and
extendable outwardly therefrom; and
an crane operator control station carried by said trailer.
2. The crane apparatus according to claim 1, further comprising
10 a vibratory driver suspended from a free end of said crane and arranged
and configured to grasp and then drive a piling sheet into the ground.
3. The crane apparatus according to claim 1 wherein said
wheels comprise tires having a width of about 16 inches.
15
4. The crane apparatus according to claim 1, comprising a
crane hydraulic power unit and an accessory hydraulic power unit carried
by said trailer.
- 20 5. The crane apparatus according to claim 1, further comprising
a sheet piling driver suspended from said crane.

6. The crane apparatus according to claim 1, wherein said crane operator control station further comprises a control panel having controls for operating said crane, a seat mounted to said trailer for supporting an operator at said control panel.

5

7. The crane apparatus according to claim 1, comprising a hydraulic power unit having controls, and a seat supported on said trailer and located for an operator to manually control said controls.

10

8. The crane apparatus according to claim 6, wherein said seat is arranged facing in a direction perpendicular to a longitudinal axis of said trailer.

15

9. The crane apparatus according to claim 1, further comprising outriggers arranged at respective back corners of said trailer and deployable to support the trailer corners from the ground.

20

10. The crane apparatus according to claim 9, wherein said outriggers are hydraulically deployable.

25

11. A trailer-mounted crane apparatus, comprising:
a platform supported from a ground surface on at least two
wheels;
a hydraulically operated crane arm mounted to said platform
5 and extendable therefrom;
a hydraulic crane power unit mounted to said platform for
supplying pressurized hydraulic fluid to said crane arm;
a control panel for said hydraulic power unit mounted on said
platform; and
10 an operator seat supported from said platform and arranged
in front of said control panel.

12. The trailer-mounted crane apparatus according to claim 11,
further comprising a vibratory sheet pile driver suspended from said crane
15 arm, and said trailer-mounted crane apparatus further comprises a
hydraulic driver power unit for driving said vibratory sheet pile driver.

13. The trailer-mounted crane apparatus according to claim 12,
wherein said crane arm includes a longitudinally extended hydraulic
20 cylinder mounted longitudinally along said platform.

14. The trailer-mounted crane apparatus according to claim 13,
wherein said hydraulic crane power unit is mounted on said platform in
front of said crane, and said control panel and said operator seat are
mounted in front of said hydraulic crane power unit and laterally of said
5 crane, and said hydraulic crane power unit is mounted in front of said
crane.

15. The trailer-mounted crane apparatus according to claim 14,
further comprising a sheet pile driver retainer extending rearwardly of said
10 platform, and mounted to said platform.

16. The trailer-mounted crane apparatus according to claim 14,
further comprising a sheet pile driver cradle mounted to said platform on a
side of said crane opposite to said operator's seat.

ABSTRACT OF THE DISCLOSURE

A trailer-mounted crane apparatus includes a trailer supported from a ground surface on at least two wheels. A hydraulically operated crane arm is mounted to the trailer and is extendable outwardly. A crane

5 hydraulic power unit is mounted to the trailer and supplies pressurized hydraulic fluid to the crane arm. A vibrational sheet piling driver can be supported by the crane arm. A vibrational hydraulic power unit for supplying power to the driver is mounted on the trailer. A control panel for the crane hydraulic power unit and the vibrational driver hydraulic power
10 unit, and an associated operator's seat, are also mounted on the trailer.

The crane apparatus includes wide tires for reducing the surface pressure under the apparatus. This allows the apparatus to be transported across and used on delicate surfaces such as golf course greens and other groomed surfaces.

FIG. 1

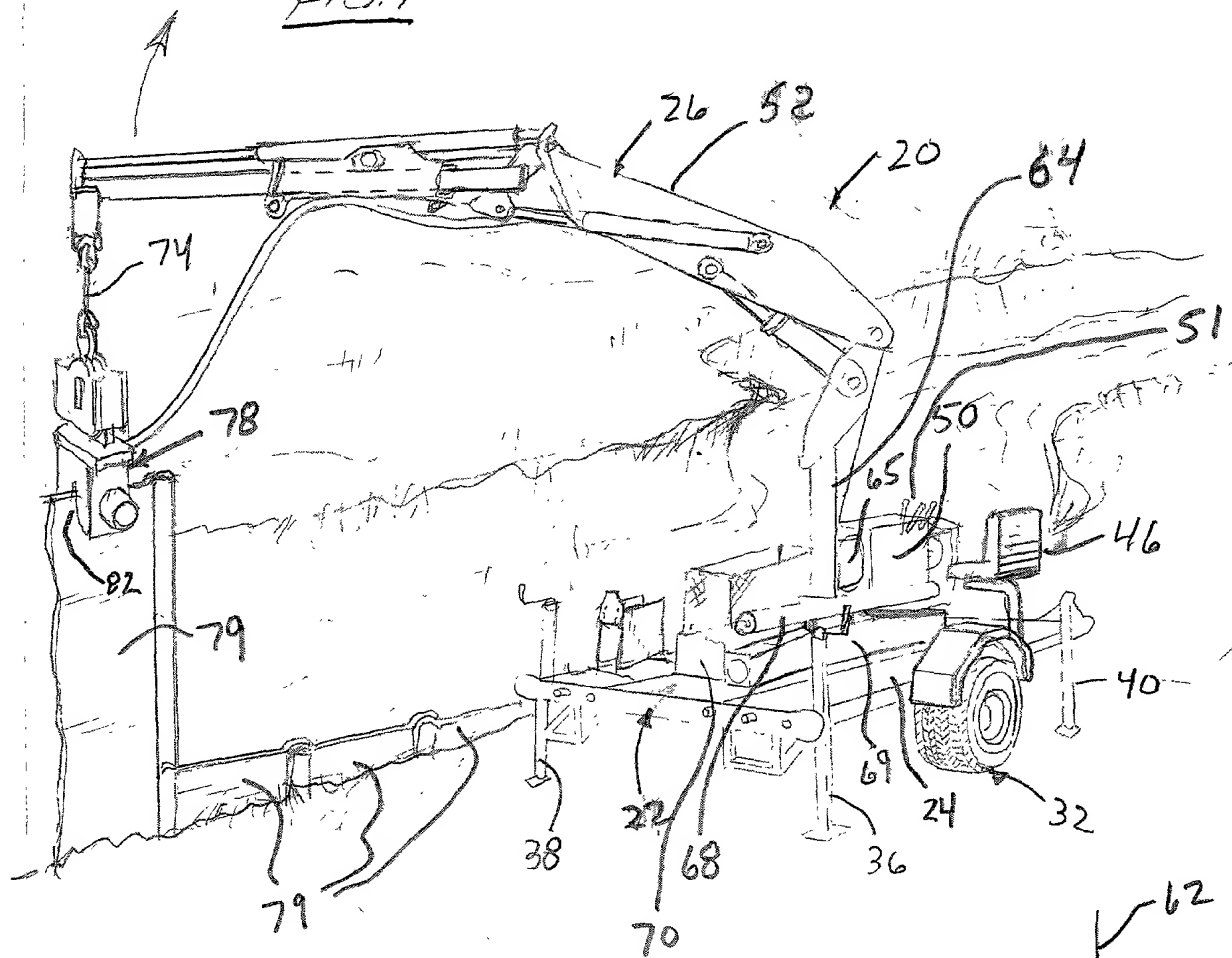


FIG. 2

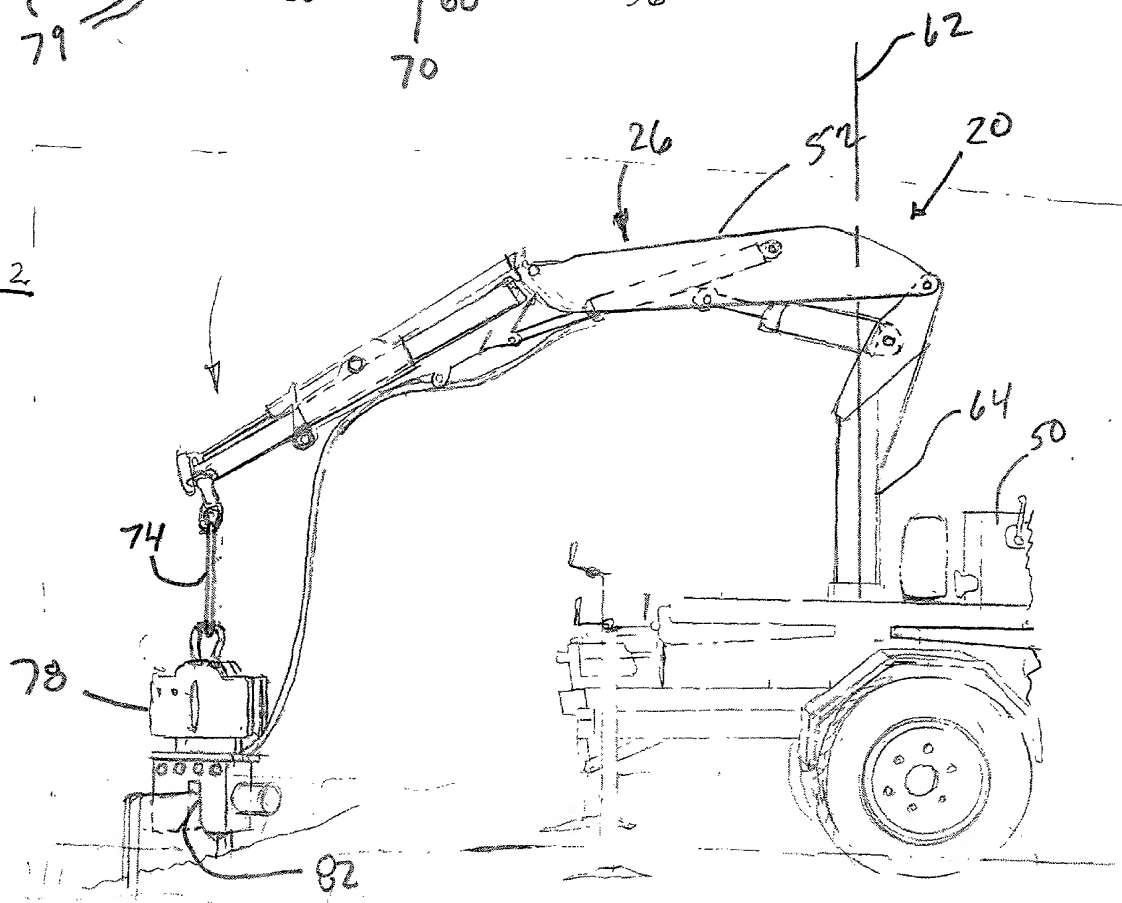
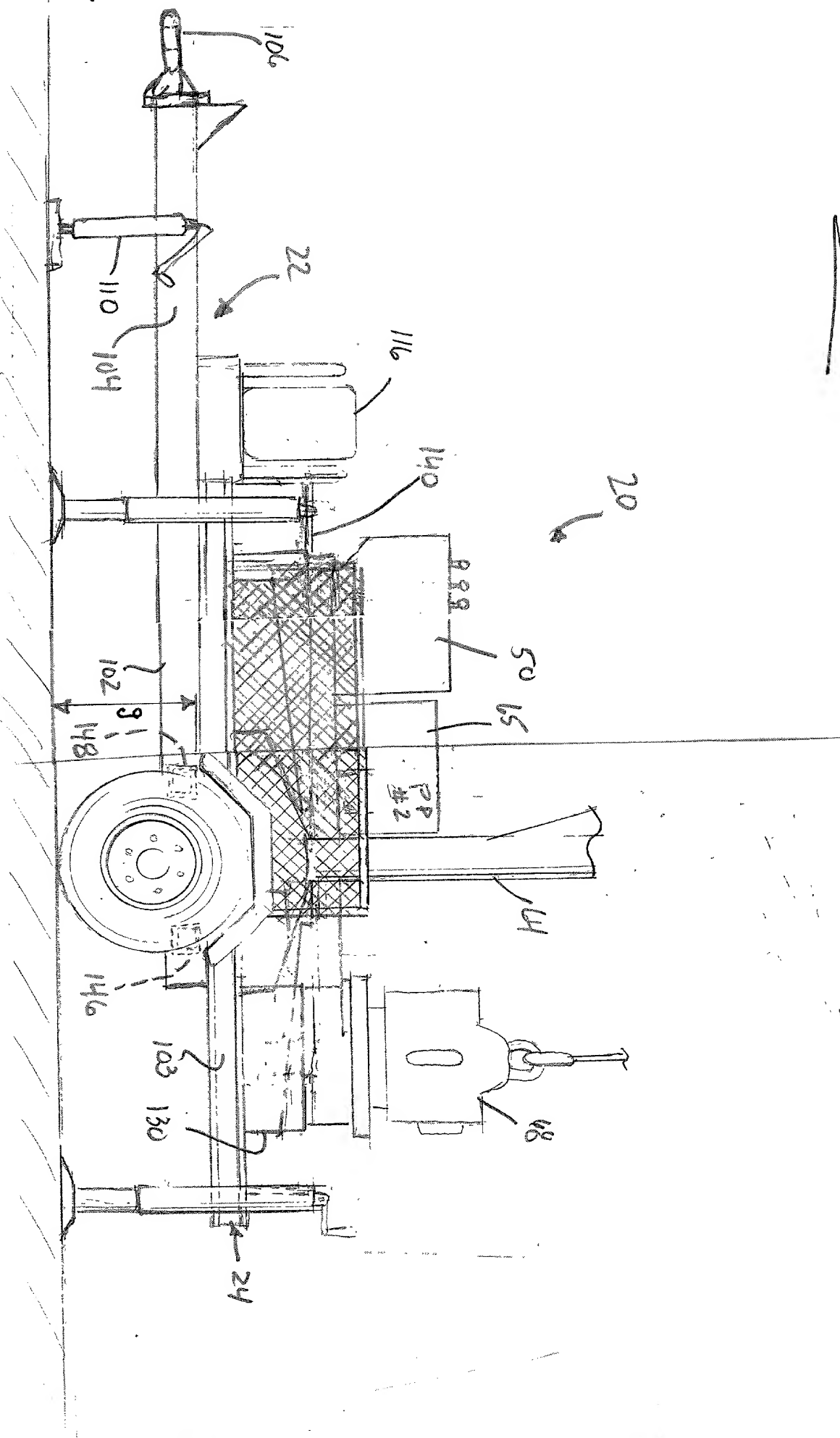


FIG 4



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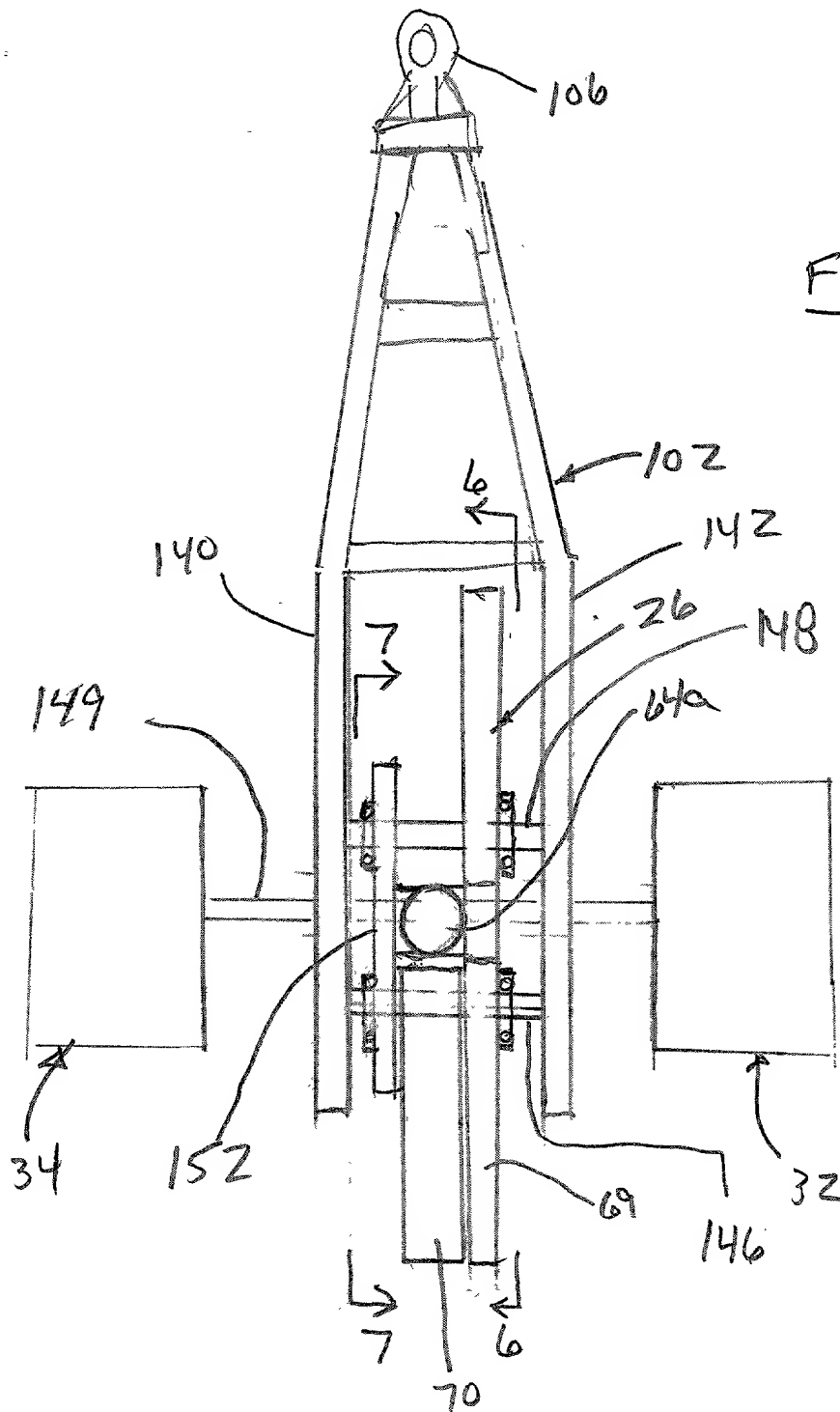


FIG 5

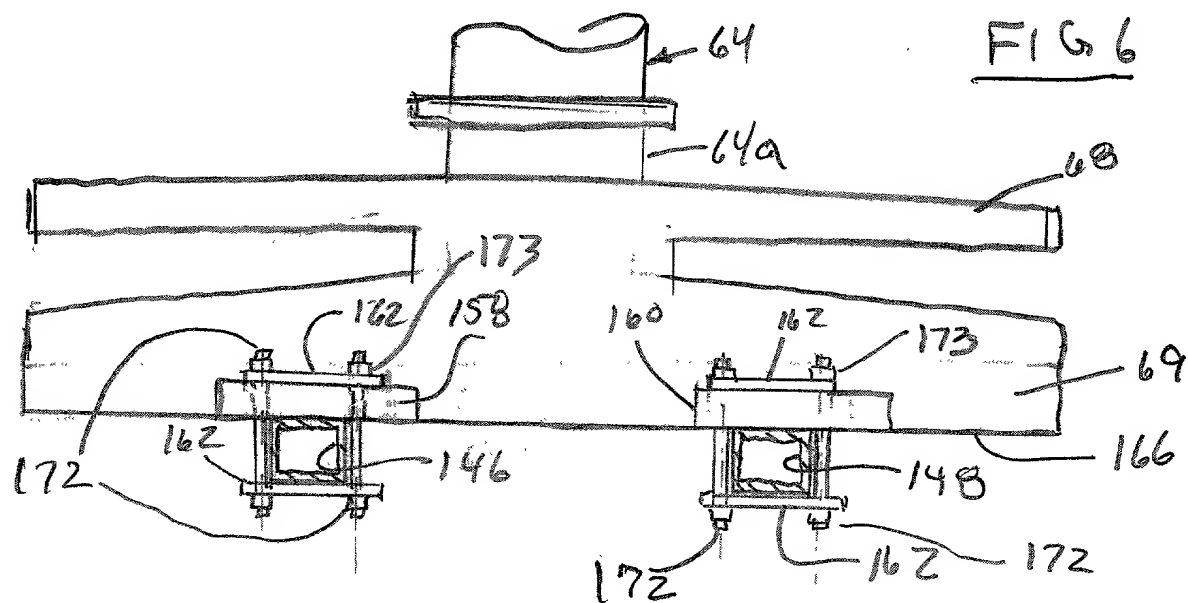


FIG 6

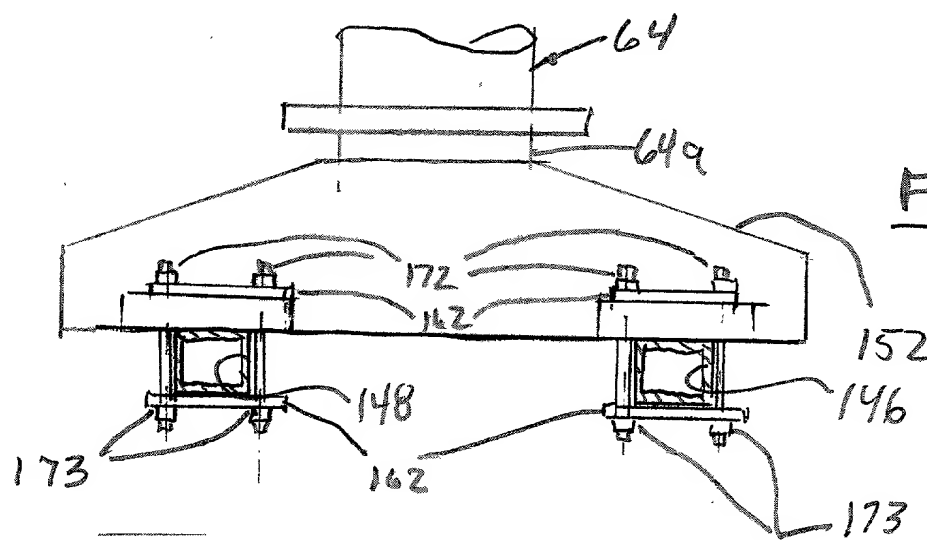


FIG 7

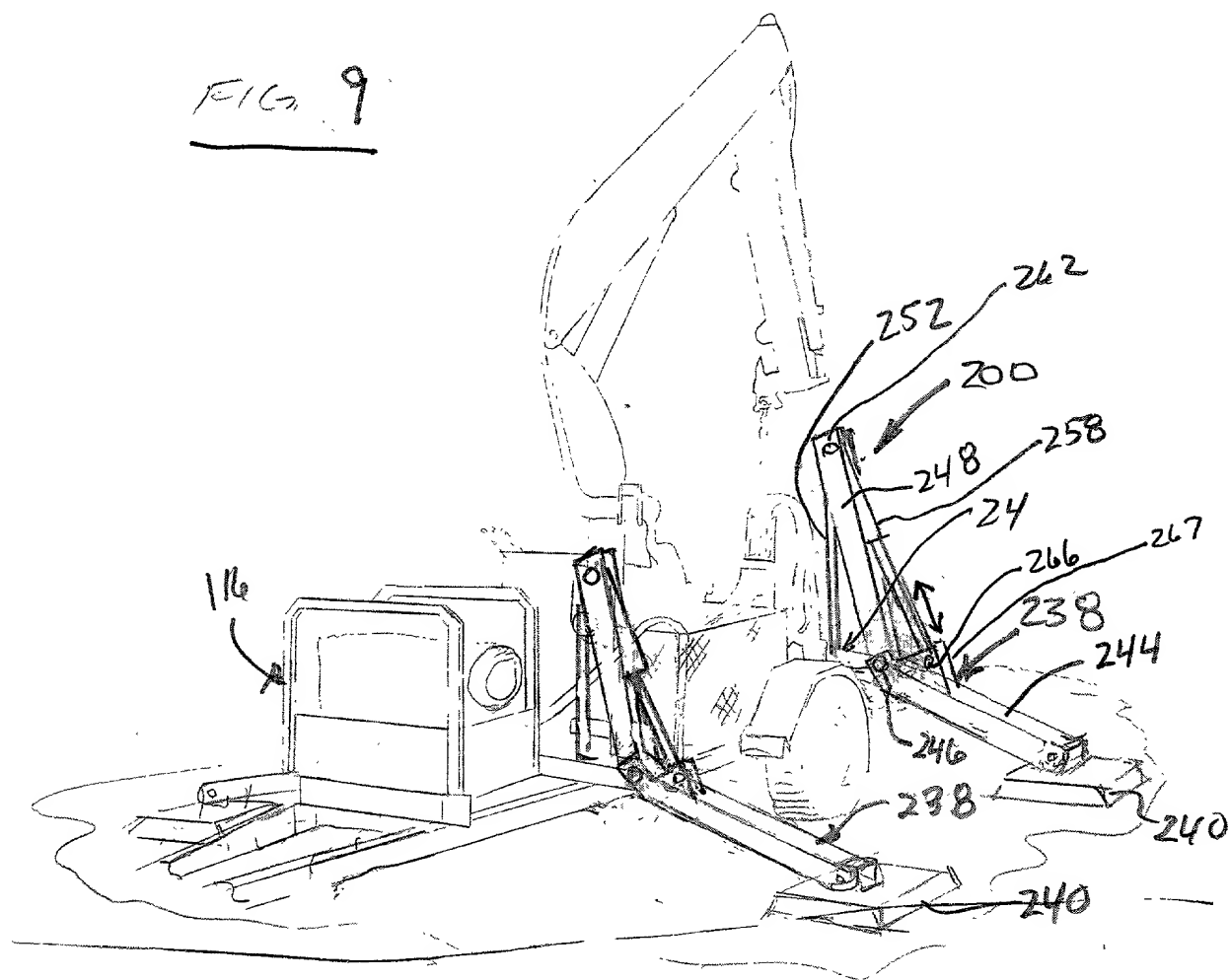
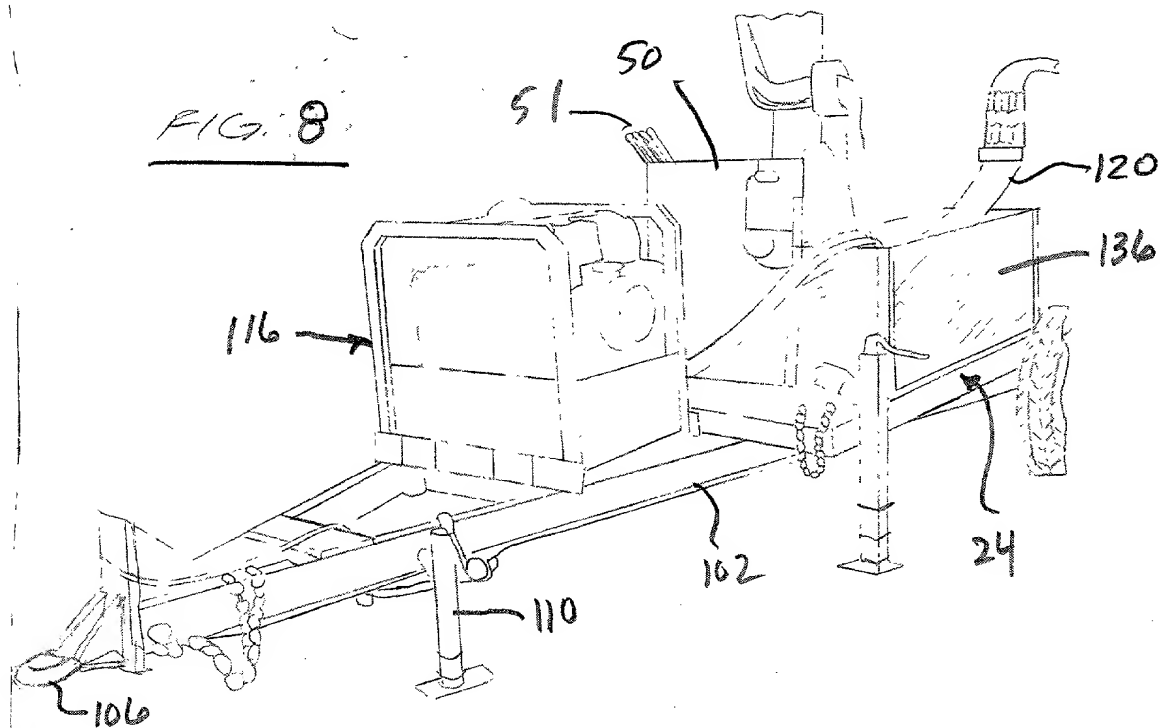


FIG. 8



<p align="center">DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)</p> <p><input checked="" type="checkbox"/> Declaration Submitted With Initial Filing <input type="checkbox"/> Declaration Submitted After Initial Filing (surcharge (37 CFR 1.16(a)) required)</p>		Attorney Docket No.:
		First Named Inventor: Darryl Scott Burkett
		<i>COMPLETE IF KNOWN</i>
		Application Number: RIV6172P
		Filing Date:
		Group Art Unit:
		Examiner Name:

As a below-named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first, and sole inventor (if only one name is listed) or an original, first, and joint inventor (if plural names are listed) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **TRAILER-MOUNTED CRANE APPARATUS**, the specification of which:

- ☒ is attached hereto; or
- ☐ was filed on _____
as Application Serial No. _____
and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information to the Patent and Trademark Office known to me to be material to patentability of this application, as defined in 37 CFR. 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Numbers	Country	Foreign Filing Date	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- ☐ Additional foreign application numbers are listed on a supplemental priority data sheet (PTO/SB/02B) attached hereto.

I hereby claim the benefit under 35 U.S.C. 119 (e) of any United States application(s) listed below.

Application Number(s)	Filing Date	<input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority data sheet (PTO/SB/02B) attached hereto.

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT International application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

U.S. Parent Application or PCT Parent Number	Parent Filing Date	Parent Patent Number (if applicable)

☐ Additional U.S. or PCT International application numbers are listed on a supplemental priority data sheet (PTO/SB/02B) attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Lawrence J. Chapa	Reg. No. 39,135	Paul M. Odell	Reg. No. 28,332
Randall T. Erickson	Reg. No. 33,872	Robert B. Polit	Reg. No. 33,993
Stephen D. Geimer	Reg. No. 28,846	Elaine M. Ramesh	Reg. No. 43,032
Allen J. Hoover	Reg. No. 24,103	Keith V. Rockey	Reg. No. 24,713
Martin L. Katz	Reg. No. 25,011	John F. Rollins	Reg. No. 38,013
Kathleen A. Lyons	Reg. No. 31,852	Thomas I. Ross	Reg. No. 29,275
John P. Milnamow	Reg. No. 20,635	Joel E. Siegel	Reg. No. 25,440
Lisa V. Mueller	Reg. No. 38,978	Paul M. Vargo	Reg. No. 29,116

whose mailing address for this application is: **ROCKEY, MILNAMOW & KATZ, LTD.**
Two Prudential Plaza - Suite 4700
180 North Stetson Avenue
Chicago, Illinois 60601
Telephone: (312) 616-5400
Facsimile: (312) 616-5460

I hereby declare that all statements made herein of my knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor:	Darryl Scott Burkett	
Citizenship:	U.S.A.	
Residence:	Barrington, Illinois	
Post Office Address (if different):	Riverwalls Ltd., P.O. Box 562, Barrington, Illinois 60011	
Signature:		Date:

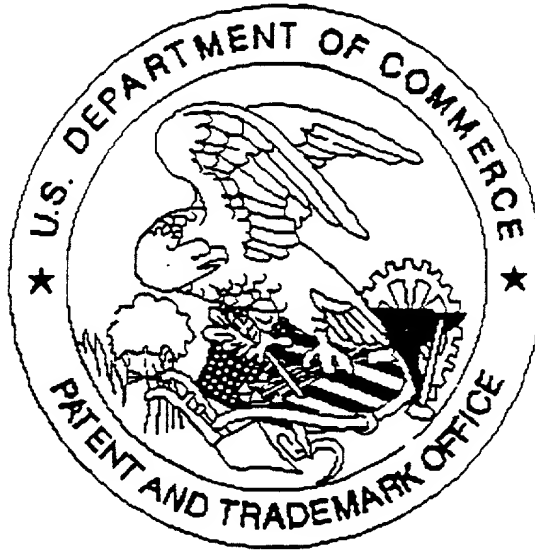
Name of Additional Inventor, if any:		
Citizenship:		
Residence:		
Post Office Address (if different):		
Signature:		Date:

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Citizenship:		
Residence:		
Post Office Address (if different):		
Signature:		Date:

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Citizenship:		
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